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I can't remember Your Honor: Offenders Who Claim Amnesia

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Abstract

Objective: Persons who claim memory loss for the crime of which they are suspected represent a problem for the legal system. When such claims emerge, the court often relies on expert testimonies. Mental health professionals who act as experts in these cases often assume that the memory loss is caused by a combination of strong emotions and abundant substance use (e.g., alcohol). It is also common to gather arguments for such an interpretation by interviewing the offender or suspect. However, discriminating between different kinds of amnesia requires the use of sophisticated tests and tasks. Methods: By reviewing clinical, experimental, and psychometric literature, this article addresses several forms of crime-related amnesia and discusses the difficulties that arise when expert testimony about this phenomenon is given. It also emphasizes the importance of technical knowledge about diagnostic quality parameters. Results: A review of the literature shows that dissociative amnesia is not the only or even the most prevalent form of offender amnesia. Experts should at least take the possibility of other forms of amnesia (i.e., organic amnesia; malingered amnesia) into account. Conclusion: Expert testimonies about crime-related amnesia should not rely exclusively on interviews or archival data. Rather such testimonies require tests and tasks combined with good diagnostic interviews (German J Psychiatry 2002; 5: 24-34)

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Introduction

It is not uncommon that offenders claim memory loss (i.e., amnesia) for their crime. As a matter of fact, 25-45% of criminals found guilty of homicide claim amnesia for the event (e.g., Kopelman, 1995). In cases where suspects claim crime-related amnesia, the court often asks for expert testimony. Triers of fact seem to assume that an expert is able to differentiate between various kinds of genuine amnesia, as well as between genuine amnesia and simulated amnesia. According to Schacter (1986), there are two obvious legal reasons as to why it is important to explore crime-related amnesia. To begin with, amnesia raises the issue of automatism, which refers to criminal behavior that is executed unconsciously and without intent. The issue of automatism is, of course, critical for legal responsibility. We will return to the difference between "sane" and "insane" automatism later on. Secondly, amnesia raises the issue of competency to stand trial. An accused who has no memory of the crime event cannot plead in their own cause, simply because they are unable to inform their counsel (Schacter, 1986). Thus, such a person might be incompetent to stand trial.

In a study of Merckelbach, Cima, and Nijman (2002) popular beliefs about crime-related amnesia were investigated.

The authors describe a typical but real crime case in which an offender, after a night out with heavy use of alcohol and cocaine, stabbed someone to death. The offender claimed amnesia for the homicide. The court appointed a mental health professional in order to give an expert testimony about the amnesia of the offender. Based on two interviews, this expert concluded that the crime-related amnesia was a result of "the high level of alcohol and drug use". This case was administered to 54 lay persons. They were asked whether they thought that genuine amnesia would be a plausible scenario in this type of crime. The majority of them (82%) indicated that it was a plausible scenario. A majority (76%) also felt that the court was very wise to appoint a forensic expert. As well, respondents had very strong opinions about the origin of the amnesia. A large majority of the respondents (70%) felt that alcohol, cocaine, strong emotions or a combination of these are responsible for offenders' amnesia. Apparently, offenders who claim crime-related amnesia do not need to worry that their claim meets widespread disbelief. Merckelbach and associates (2002) wondered whether this has to do with the way in which they presented this case. They construed a version of the case in which the offender claimed to remember "every second of the stabbing" extremely well. Having read this version, a new sample of respondents (N = 54) were asked whether they could also imagine the opposite, namely an offender developing amnesia for the stabbing incident. Again, the large majority (74%) thought that it is perfectly possible that an offender develops complete amnesia for his crime. The idea that strong emotions, alcohol and/or drugs may affect offenders in such way that they fully forget what they have done is apparently widespread.

The ideas of lay people about crime-related amnesia would be of little or no concern to us, were it not that judges and lay judges are lay people who have to decide about the plausibility of claims of crime-related amnesia. One would argue that these triers of fact rely on expert testimony precisely to overcome their lack of technical knowledge. On the other hand, in cases of claimed amnesia, mental health professionals who act as expert witnesses often rely on notions and assumptions that come dangerously close to those of lay people. In the sections that follow, we first discuss the prevalence rates and different manifestations of crime-related amnesia. We then move on to the legal significance of amnesia claims. Next, we focus of on several crucial discriminations that experts have to make in cases where such claims emerge: Thus, the expert has to differentiate between dissociative amnesia, feigned (i.e., simulated amnesia), and organic amnesia. He/she also has to consider critically the precise role that alcohol plays in this category of cases. Following a detailed examination of these issues, we turn to diagnostic and psychometric topics. We will argue that powerful tools are available to discriminate between various forms of crime-related amnesia. We conclude with a consideration of the specialized knowledge that these seemingly simple tools require.

Crime-related Amnesia

Offenders who claim amnesia for their crime are by no means rare. In an older study of Leitch (1948), 51 murderers were interviewed and 14 (27%) of them claimed amnesia for their crime. Taylor and Kopelman (1984) replicated this study by interviewing 34 murderers: 9 (26%) of them claimed amnesia. In a more recent study, Gudjonsson, Petursson, Skulason, and Sigurdardottir (1989) investigated 64 convicted criminals. This time, 21 (32%) claimed amnesia for there crime. As a rule of thumb, 20 to 30% of offenders of violent crimes claim amnesia for their crime. While these claims are often raised in the context of murder or manslaughter cases, there are other crime categories in which claims of amnesia do occur. For example, claims of amnesia regularly occur in sexual crime cases (Bourget & Bradford, 1995), domestic violence cases (Swihart, Yuille & Porter, 1999), and fraud cases (Kopelman, Green, Guinan, Lewis & Stanhope, 1994).

In the literature, all kinds of taxonomies have been proposed to distinguish between different types of amnesia (e.g., Schacter, 1986; Loewenstein, 1991; Kopelman, 1995; Kihlstrom & Schacter, 1995). Most taxonomies agree that, at the very least, three amnesia types should be considered: dissociative amnesia (formerly termed psychogenic or functional amnesia), organic amnesia, and feigned amnesia ("malingered amnesia"). Dissociative amnesia for criminal behavior is thought to originate from extreme emotions that accompany such behavior. Several authors have argued that dissociative amnesia is characteristic for crimes that are unplanned, involve a significant other, and are committed in a state of strong agitation (e.g., Loewenstein, 1991; Kopelman, 1995). The idea behind this is that extreme levels of arousal during the crime may hamper memory retrieval at a later point in time. Thus, a failure in so-called retrieval processes would underlie dissociative amnesia such that the offender who subsequently has come to his senses, finds it impossible to access memories stored during a moment of turbulence. A term often used in the Anglo-Saxon literature to describe amnesia as a consequence of strong emotions (e.g., rage) is "red-out". In the words of Swihart et al. (1999): " Apparently, an individual can get so angry with his/her intimate partner that s/he can severely beat or kill that partner and then not remember doing so: that is, they can experience a red-out resulting in circumscribed amnesia" (p. 200). We will discuss the merits of this interpretation later on.

Organic amnesia is always caused by a neurological defect. This defect may be structural (e.g., epilepsy, brain trauma), but it may also be momentary such as in the case of alcohol or drug intoxication. Kopelman (1995) assumes that memory loss in organic amnesia has to do with storage problems rather than retrieval problems: due to an epileptic seizure, brain damage or intoxication, offenders would not be able

to store their memories in the first place, which would eventually lead to a total "blackout" for their crime.

A number of authors have emphasized that excessive alcohol use often contributes to dissociative amnesia for crime (Kopelman, 1995; Bourget & Bradford, 1995; Swihart et al., 1999). Bower's (1981) "state-dependent memory theory" is often invoked to account for the combination of dissociative amnesia and alcohol (Swihart et al., 1999). In short, this theory states that when memories are stored in an exceptional context (strong emotion and/ or under the influence of alcohol), subsequent retrieval of these memories is facilitated when a similar context is reinstated. However, in a different context (e.g., when one is relaxed and sober), the pertinent memories would be inaccessible and so dissociative amnesia would occur. The case of Sirhan Sirhan, who was held responsible for the murder on Robert Kennedy, is often presented as an example of state dependent memory. Sirhan claimed that he was unable to remember the murder. However, when he was hypnotized and brought into an agitated state, he suddenly said he remembered the details of the murder.

As for feigned amnesia, offenders may malinger amnesia for a crime in an attempt to obstruct police investigation and/or to avoid responsibility for their acts. In an older study, Hopwood and Snell (1933) found that 20% of the offenders who claimed amnesia were malingerers. However, there are good reasons to believe that the rate of malingering is actually much higher (see below). The literature provides strong examples of defendants who feigned amnesia in order to gain tactical advantage in legal procedures. Our favorite example is that of Rudolf Hess, who at the start of the "Nuremberg" trials, claimed to be amnestic for his Third Reich period. A group of prominent psychiatrists examined Hess and concluded that his amnesia was genuine. When it became clear to Hess that the amnestic role confers a disadvantage in the sense that one cannot respond to allegations, he suddenly announced during one of the trial sessions that he had fooled the psychiatrists and feigned his amnesia (Gilbert, 1971; for a somewhat different interpretation see Picknett, Prince & Prioir, 2001).

The Legal Context

Does it matter legally when defendants claim crime-related amnesia? For the Anglo-Saxon situation Parwatikar, Holcomb and Menninger (1985) noted that: "no court has found a defendant incompetent to stand trial solely because of amnesia" (p.202) (see also Hermann, 1986). And, indeed, in Anglo-Saxon countries amnesia does not figure in the listing of disorders that regularly lead to "not guilty by reason of insanity" trial outcomes. Typically, such outcomes involve schizophrenia and mood disorders, especially in combination with alcohol or drug use.

Still, according to some leading Anglo-Saxon commentators, claims of amnesia may have far-reaching legal implications (e.g., Bradford & Smith, 1979). Meanwhile, it is not amnesia per se, but what amnesia reveals about the state of the defendant at the moment he committed his crime. More specifically, amnesia may indicate a state of "automatism", which refers to unconscious, non-intentional, and therefore uncontrollable behavior. In the literature, eccentric examples of "automatic" crimes committed during sleepwalking, epileptic seizures, or hypoglycaemia states, abound.

In countries like Canada and Australia, automatism has been divided into "sane" and "insane" automatism. For both types of automatism, it is assumed that the mens rea (i.e., "wicked mind") aspect of the crime, is at stake (Hermann, 1986). "Sane" automatism refers to a crime committed by someone who is essentially healthy, but who is in a temporary state of madness due to some external agent (e.g., insulin). Such a scenario may lead to acquittal. "Insane" automatism refers to a crime originated from structural brain dysfunction. The prototypical example is the man who killed his neighbor during an epileptic seizure (Fenwick, 1993). Such a scenario can lead to a "not guilty by reason of insanity" verdict. Kopelman (1995) notes that "automatic" crimes always fall prey to amnesia. However, the opposite does not hold: when a defendant claims crime-related amnesia, it does not necessarily imply that the crime came about automatically (Kalant, 1996). Curiously enough, this is nevertheless what the German Bundesgerichtshof seems to think, because it argued that "a verified amnesia for the criminal act - alone or in combination with other factors – is a sign of an emotionally based disorder of consciousness" (BGH 4 Str 207/87; see also Barbey, 1990).

Another point that is important to stress is that the distinction between controlled behavior, "sane" automatism, and "insane" automatism is more problematic than it at first glance may appear. Referring to several case examples, McSherry (1998) showed that this distinction is highly dependent on arbitrary judgments made by expert witnesses: it just depends on what a forensic expert is willing to consider as a structural brain dysfunction. She described two similar cases of domestic murder. Due to expert witness testimonies, one case was classified as "sane" automatism leading to full acquittal, whereas the other case, was classified as an example of "insane" automatism, leading to a "not criminally responsible" verdict and admission to a psychiatric hospital.

What science says

Lay persons' ideas about what is possible, do not by definition have to be wrong. However, for a trial judge who is confronted with a defendant claiming amnesia, the issue of

what is possible is less interesting. In as much as the judge appreciates expert witness testimonies, he will mostly benefit from an expert who educates him about the type of amnesia that the defendant is suffering from and how this diagnostic judgment was reached. For the expert witness, it is very difficult to differentiate between dissociative, organic or feigned amnesia on the basis of interviews with the defendant. This has to do with the fact that simulators can give a compelling imitation of someone with a dissociative or organic amnesia. It is only on the basis of psychological tests and tasks, that an expert will be able to identify simulators. Nevertheless, our impression is that mental health professionals acting as experts in cases of amnesia often use interviews with the defendant as the sole source for making their diagnostic judgments. This state of affairs is hardly surprising: the average mental health professional is not a memory specialist and has no specialized knowledge about tests that might be helpful in discriminating between dissociative, organic, and feigned amnesia. We will take a closer look at this distinction below.

Dissociative versus feigned amnesia

Dissociative amnesia is defined as "an inability to recall important personal information, usually of a traumatic or stressful nature, that is too extensive to be explained by ordinary forgetfulness" (American Psychiatric Association, 1994: p. 477). A number of authors have argued that the term dissociative amnesia is quite confusing (Pope, Hudson, Bodkin & Oliva, 1998; Kopelman, 1995). It not only suggests that the cause of the memory loss is a dissociation between consciousness and memory, it also assumes that memory loss for emotional trauma does exist. Although lay people find it very plausible that an emotional provocative event, like murder, can lead to memory loss (cf. supra), specialists have not yet reached a consensus about this. For example, some authors (e.g., Kopelman,1995) opine that dissociative amnesia does exist and their most important argument is that defendants who claim amnesia often inform the police about the crime: "This makes an account of amnesia as simulation to avoid punishment less plausible" (p.435; for a similar reasoning, see Porter, Birt, Yuille & Herve, 2001). However, this argument is not very convincing. A defendant who knows that there is a vast amount of forensic evidence against him, may argue that he will make a more sympathetic impression on triers of fact if he simulates amnesia than if he provides them with a lucid description of the crime details. Thus, Sadoff (1974) argues that most cases of dissociative amnesia are actually feigned. There are three good reasons to take his point seriously.

The first is that there is quite some knowledge about the psychological characteristics of those who claim dissociative amnesia for a crime. Older studies reported that criminals who make such claims can be distinguished from other criminals by their relatively low intelligence and their hysterical traits (O'Connel, 1960; Parwatiker et al., 1985). In this context, hysterical traits refers to manipulative behavior, including the tendency to feign symptoms (O'Connel, 1960).

While the concept of hysteria has largely disappeared from psychiatric vocabulary, the findings of more recent studies in this domain point in the same direction. For example, Lynch and Bradford (1980) reported that claims of amnesia are often raised by defendants with an antisocial personality disorder. A hallmark feature of this disorder is, of course, manipulative behavior (Porter et al., 2001). Similarly, Cima, Merckelbach, Hollnack, and Knauer (2002a) noted that criminals who claimed amnesia had low intelligence and displayed antisocial personality features. The picture emerging from these studies is that defendants who claim dissociative amnesia often rely on a simple form of denial in an attempt to minimize their responsibility.

A second reason to critically consider claims of dissociative amnesia is that the idea of amnesia for crime is based on the dubious assumption that "the majority of crimes which are followed by amnesia are those accompanied by strong emotional reactions" (Hopwood & Snell, 1933, p.32). According to this interpretation, strong emotions lead to repression or, to use a more recent notion, to dissociation and this would produce "retrieval" problems. If this line of reasoning were correct, one would expect that, for example, victims of concentration camps would also display amnesia for the horrifying events they have experienced. However, this is not the case (e.g., Kuch & Cox, 1992; Yehuda, Elkin, Binder-Brynes, Kahana, Southwick, Schmeidler & Giller, 1996). On a related note, eyewitnesses of extreme violence seldom develop amnesia for the events they witnessed (Porter et al., 2001). In short, the notion that people may develop amnesia for events that are accompanied by strong emotions, is very controversial (Pope et al., 1998) and, therefore, it is wise to consider dissociative amnesia as a rare phenomenon.

A third reason to be skeptical about claims of dissociative amnesia is that recent psychiatric literature shows that a not insignificant minority of people tend to feign a variety of symptoms and tend to confabulate stories if this serves their interests. For example, it is estimated that as many as 20% of closed head injury patients pursuing financial compensation exaggerate their symptoms (Binder & Rohling, 1996). Likewise, in the United States hundreds of Vietnam veterans with Post Traumatic Stress complaints have never even served in Vietnam (Burkett & Whitley, 1998). When motor vehicle accident victims feign neurological complaints and when military personnel invent a complete autobiography to qualify for disability payments, why should the criminal who simulates amnesia be a rarity? Let's put it in a different way: lay persons as well as many expert witnesses tend to view dissociative amnesia as the rule and feigned amnesia as the exception. Given the considerations discussed above, we think that it would be wise to reverse these probability estimates. This conclusion is further supported by studies in which normal subjects were instructed to play the role of a

murderer who during interrogation is confronted with abundant evidence. The most frequently chosen strategy of these subjects is to claim amnesia for the criminal act and to attribute it to an internal force that they cannot control (Spanos, Weekes & Bertrand, 1986; Merckelbach, Devilly & Rassin, 2001a).

The role of alcohol

As mentioned earlier, excessive alcohol or drug use is often said to precede criminal acts for which later dissociative amnesia is claimed. At least, that is what criminals who claim such memory loss tell researchers and expert witnesses. The "state-dependent memory" hypothesis is often invoked to explain the apparent link between alcohol and amnesia (Swihart et al., 1999), but a close look at the literature shows that this hypothesis is not based on solid evidence. For example, in a study of Wolf (1980), a substantial amount of alcohol was given to criminals who had committed murder under the influence of alcohol and who claim to be amnestic. The "state-dependent memory" hypothesis would lead one to predict that alcohol would produce complete disappearance of the amnesia, but this is not what happened. Subjects maintained that they could not remember the crime details.

Admittedly, the phenomenon of "alcohol blackout" does exist. However, this phenomenon is best viewed as an organic form of amnesia resulting from an excessive amount of alcohol consumed within a very short time span (e.g., 5 glasses of whisky or 20 glasses of beer within 4 hours; Goodwin, 1995). Even if subjects consume such a large dose, only some of them will develop an "alcohol blackout". Furthermore, in most cases where dissociative amnesia is claimed, alcohol doses do not reach such an extreme level. This suggests that in these cases, defendants' reference to alcohol or drug use may fulfil a different function, namely that of the "partial excuse for the essentially inexcusable" (Room, 2001: p. 194). That is, for those who have seriously violated the law, an appeal to alcohol or drug intoxication may give an explanation for the crime that has been committed as well as for the memory loss that is claimed. The example of the Canadian Supreme Court shows that courts are not insensitive to such "intoxication defense". In the case of a rapist who claimed not to remember the crime because he was in a state of alcohol intoxication, this Court ruled that the crime had been committed in a state of "drunken automatism" (Kalant, 1996). Lay persons not only seem to have strong opinions about the plausibility of dissociative amnesia, they also have strong opinions about the behavioral and memory effects of alcohol or drugs. Again, these opinions are not always in line with what is actually known about these effects.

The role of expectations

Experiments show that the behavioral effects of alcohol are to a great extent guided by expectations that people have about these effects: "Things that are believed real are real in their consequences" (Thomas & Thomas, 1928: p. 572). A straightforward procedure to demonstrate this phenomenon is the so-called "balanced placebo design". The crux of this design is that some subjects are given a non-alcoholic drink that they believe to contain alcohol, whereas other persons consume an alcoholic drink that they believe is a non-alcoholic refreshment. Under these circumstances, extravert behavior, tension reduction, and other positive as well as negative effects that people associate with alcohol do not depend on actual alcohol intake, but on the belief that one has consumed alcohol (Critchlow, 1986). This finding underlines the fact that people have strong ideas about the effects of alcohol which in turn may affect their behavior.

Is it possible that a similar expectancy effect occurs in cases of dissociative amnesia? In other words, is it possible that some defendants claim amnesia for their crime because they assume that this is a probable outcome, given the traumatic character of the event and the use of alcohol? The case of Gudjonsson, Kopelman, and MacKeith (1999) demonstrates that such an imaginary amnesia does exist. In this case, a defendant was convicted for the murder of a little girl. During the police interrogations, he could not remember anything of the crime. Experts interpreted this as a manifestation of dissociative amnesia, a scenario in which the defendant himself started to believe, subsequently, it became clear that he was innocent.

Germane to the issue of expectations is also an experiment of Christianson and Bylin (1999). These authors gave their subjects a case vignette of a murder and subjects were instructed to identify themselves with the offender. Next, one group of subjects was told to play the role of an amnestic offender during a task that consisted of a series of questions about the case. The control group was encouraged to perform this task as best they could. After a week, subjects returned to the lab and, again, answered questions about the case. This time, all subjects were instructed to perform as best they could. During the first testing session, subjects who played an amnestic role gave fewer correct answers than the control group. This is not remarkable: it only shows that the "amnestic" subjects took their role seriously. However, during the one-week follow-up test session ex-simulators were still performing under the level of control subjects. This is remarkable: apparently, "playing" amnesia has memory-undermining effects. It is not too far-fetched to assume that expectations are the driving force behind this effect. That is, people who initially play the role of an amnestic person may have a strong expectation that they will perform poorly on subsequent memory tasks. This, in turn, may give rise to a "self-fulfilling prophecy" when the person is given such a memory task. This phenomenon is also known from studies on placebos. Subjects who receive a

placebo in combination with the story that it is a memory-undermining substance later perform less well on memory tasks than do control subjects (Kvavilashvili & Ellis, 1999). To sum up, then, a defendant who claims memory loss is often classified by experts as someone with dissociative amnesia, but there are at least two alternative interpretations that should be considered: malingered amnesia and imaginary amnesia.

Organic versus feigned amnesia

Unlike dissociative amnesia, organic amnesia is a relatively unproblematic phenomenon. In many cases, organic amnesia will be a persistent symptom of traumatic brain injury, or closed head injury. Note that in this context the word trauma has a completely different meaning. In the psychiatric literature, it refers to a major emotional event (e.g., a crime), whereas in the neurological context it refers to the external causes (accidents, drugs, fights) of acute brain damage (Hacking, 1996). Even in cases of mild traumatic brain injury, acute loss of consciousness and subsequent Post Traumatic Amnesia (PTA) may occur. PTA refers to disoriented behavior and serious memory problems immediately after the incident that caused the brain injury. When loss of consciousness exceeds 30 minutes and PTA duration is longer than 24 hours, the traumatic brain injury is said to be severe (Faust, 1996).

Regardless of whether the brain injury is mild or severe, in the period after the PTA, the patient usually reports all kinds of complaints that vary from concentration difficulties to depressive feelings. These complaints are sometimes referred to as the "post-concussion" syndrome, but this impressive term suggests more clarity than the neurological literature really offers. For example, Lees-Haley, Fox, and Courtney (2001) noted that most symptoms associated with this syndrome are surprisingly aspecific and are also highly prevalent among people who never sustained a brain injury. However, an inability to recall important details of the events surrounding the trauma (the incident, the fight) – organic amnesia – is a rather specific symptom of post-concussion syndrome. According to the 19th century French memory psychologist Theodule Ribot (Haber & Haber, 1998), organic amnesia follows a course that is now known as Ribot's law. More specifically, this law refers to the phenomenon that organic amnesia pertains to the traumatic incident itself and events that immediately preceded and/or followed it, rather than events that took place long before the trauma. If such older memories have nevertheless become inaccessible, they will return sooner in the weeks following the trauma than more recent memories that have become inaccessible. Eventually, the amnesia will largely disappear, and will be limited to the traumatic event itself and the few seconds that preceded it.

There are reasons to believe that the vague aspecific symptoms of post-concussion syndrome are sensitive to simulation. This is mostly the case in civil law suits, in which, for example, vehicle accident victims require financial compensation. In such cases, it is relatively easy to feign aspecific symptoms (Youngjohn, Burrows & Erdal, 1995). Meanwhile, organic amnesia is considerably more difficult to simulate, at least for lay persons, precisely because it has such a typical course. In other words, organic amnesia requires the specific sequence of trauma, loss of consciousness, PTA, memory loss relating to recent rather than old memories, and memory recovery in such a way that older memories come back more readily than more recent ones. If a person claims organic amnesia for a traumatic event (e.g., accident) that does not fit this sequence, there is every reason to be skeptical and to consider the possibility of feigned amnesia.

Tests

If a defendant claims crime-related amnesia, how should an expert witness determine what type of amnesia the defendant is suffering from? One possibility is that the defendant has sustained brain injury and consequently developed organic amnesia. The expert may explore this possibility by examining whether and how the defendant's amnesia disappears over time. If the defendant's amnesia follows Ribot's law, that information might be crucial for the defendant's counsel. Consider the example of the defendant charged with murder. If the defendant has organic amnesia and it can be shown that this amnesia originates from the victim hitting the defendant on his head before he was murdered, then a self-defense interpretation of the murder case might be considered.

Another possibility is that a defendant believes that he is suffering from amnesia. As far as we know, there is no valid test to explore this possibility. However, with the findings of Kvavilashvili and Ellis (1999) in mind, the expert might consider giving the defendant a placebo along with the instruction that it is a memory-enhancing drug. In a way, such a manipulation is deceptive, but on the other hand, is highly similar to forensic hypnosis, because in hypnosis expectations also play a key role.

A third possibility is that a defendant feigns his amnesia. Again, this possibility needs to be scrutinized and this can be done in either of two ways.

Symptom Validity Testing

The first way is to subject the defendant to a so-called Symptom Validity Test (SVT). With this method, it is possible to identify defendants who simulate amnesia (Frederick, Carter & Powel, 1995; Denney, 1996). Basically, SVT procedures consist of a forced-choice recognition test. During SVT, the defendant is asked a series of dichotomous

(true-false) questions about the crime and the circumstances under which it took place. The defendant is instructed to guess in case he does not know the right answers because of his amnesia. Typically, 15 to 100 items are presented, each followed by a two-alternative forced-choice recognition. Typical questions asked in the SVT are for example "Did the offender use a pistol or a knife?"; "Was the person known to sell ecstasy or crack?"; "Was the victim black or white?"; and "Was the street made of cobblestones or asphalt?". With any number of items, chance performance (guessing) can be determined fairly precisely. This has to do with the fact that purely random responding will result in about 50% of the answers being correctly answered. Individuals who perform significantly below chance avoid correct alternatives, which means that they have knowledge about the correct answers, and this implies that they are feigning memory impairment. SVT is based on binomial statistics and this has the clear advantage that one can quantify memory performance.[1] Thus, one can determine the exact chance that someone with genuine memory loss will give only 3 right answers to 15 true-false questions. On the basis of chance such a person should have 6, 7 or 8 correct answers. The chance that someone with memory loss will produce only 3 correct answers is smaller than 5% (see footnote 1; the exact chance can be calculated as follows: $z = (3 + .5 - (15 \times .5)/ \sqrt{(15 \times .5 \times .5)} = 2.1$, which corresponds to a p-value of ≤ 0.02).

Several case studies have been reported in which suspected (Frederick & Carter, 1993; Frederick, Carter & Powel, 1995) or confirmed (Denney & Wynkoop, 1995) malingerers showed a response pattern in which their performance fell below chance. One study (Denney, 1996) presents three cases within the criminal forensic setting. To evaluate the assumption that the procedure actually conforms to probability standards of the binomial theorem, this author used a normative sample of 60 adults who had no prior knowledge of the events in question. Results of this study showed that this test procedure is rather robust and can handle variability in the probability of several items. Although the more questions created the more reliable the test and the more test variance it will contain (Crocker & Algina, 1986), the results of Denney (1996) suggests that even with a test of only 10 items, the varied item probability had little practical effect on the test. The sample ($N = 60$) means for each case were shown to be either the same as the hypothesized mean or were in the positive direction. For example, in one of the cases described, the defendant answered only 7 of 29 questions correctly ($z = -2.6$, $p < 0.005$) which suggests that such a performance would only occur less than 5 times out of 1000 by chance alone. The sample results of this case showed a mean of 15.83 (SD = 2.77) and a range from 8 to 23. Moreover, the distribution of item probabilities appeared quite symmetrical, suggesting that much of the variability is due to random chance.

Some researchers have argued that a clever defendant who attempts to simulate amnesia will readily recognize the rationale behind SVT. By this view, defendants would quickly realize that they have to perform at chance level (half of the answers correct and the other half incorrect). A recent study by Merckelbach, Hauer, and Rassin (2001b) tested this idea. In this study, 20 students were instructed to steal an envelope with some money. Next, students were told to simulate amnesia in a way that would convince experts. To explore how well the SVT could identify this feigned amnesia, students took 15 true-false item SVT. More than half (53%) of the student sample had less than 4 correct answers and, thus, they were identified as malingerers. The other students succeeded in performing at chance level and thus, seemed to be able to simulate in a convincing way. However, post-experiment interviews with the subjects made it clear that only a minority of them were able to verbalize the rationale behind SVT.

Given the fact that a majority of students cannot beat the SVT, the efficacy of the SVT in identifying malingering should be considerably better with less educated defendants who simulate amnesia. This is especially true if the number of SVT questions is increased. The Merckelbach et al. (2001b) experiment relied on a relatively small number of test items (i.e., 15). However, with more SVT items, say 30, it becomes more and more difficult for defendants to monitor whether one is still performing at chance level. And even when defendants perform at chance level, there is an appropriate test to examine whether the pattern of correct and incorrect answers is random (as it should be in the case of genuine amnesia) or structured (as is the case in a strategic attempt to perform at chance level) (Cliffe, 1992). A discussion of this "runs" test, falls beyond the scope of this article, but the principle behind it can be summarized as follows. Suppose you have a coin and on 15 consecutive trials you throw heads, while on the next 15 consecutive trials you throw tails. That would be nicely at chance level. However, there must be something wrong with the coin, because too few so-called "runs" have been made (namely 2) to assume that the pattern of heads and tails is random. The same is true for some forms of SVT performance at chance level. Those who during a SVT of 30 true-false items answer the first 15 items correctly and the last 15 items incorrectly, perform nicely at chance level, but are identified as malingerers by the "runs" test. So, even if the results fall within the predictably random range and distribution, but the response pattern shows that the first half of the test is answered correctly and the second half is not, it indicates a structured response pattern. To reveal malingerers one should not calculate the approximately equal numbers of true and false answers only, but should also consider whether the sequence of the true and false answers is at random.

[1] The Binominal formula is as follows: $z = [(x \pm .5) - Np)] / \sqrt{Npq}$, in which z is the test statistic (value and corresponding p can be looked up in a table), N is the number of items, x the number of correctly answered items, p the chance for a correct answer when one has to guess (idealy .5) and q is 1-p.

SVT does not require much technical equipment. All one needs is a pencil, paper, and a basic knowledge of statistics. It is essential, though, that the correct and incorrect alternatives are first evaluated by a panel of inexperienced subjects. If this panel judges the incorrect alternatives as more plausible than the correct alternatives, it is possible that someone with genuine amnesia will perform below chance level. In the clinical or forensic setting, this method of control might prove unwieldy and extremely time consuming. Nevertheless, with this restriction in mind, we would like to recommend the SVT to experts who have to examine cases in which defendants claim amnesia.

Self-reports

A second way of examining claims of amnesia, is provided by self-report questionnaires that capitalize on the tendency of malingerers to exaggerate their memory complaints (Smith, 1997). In this context, a promising questionnaire is the Structured Inventory of Malingered Symptomatology (SIMS; Smith & Burger, 1997; for a German translation see: Cima, Hollnack, Kremer, Knauer, Schellbach-Matties, Klein & Merckelbach, 2002b). The SIMS consists of 75 dichotomous (i.e., true-false) items that can be grouped into 5 subscales, each subscale containing 15 items. Subscales correspond to symptoms domains that are sensitive to malingering and include low intelligence (LI), affective disorder (AF), neurological impairment (N), psychosis (P), and amnestic disorder (AM). Items of the subscales refer to bizarre experiences (e.g., "At times I've been unable to remember the names or faces of close relatives so that they seem like complete strangers") or to unrealistic symptoms (e.g.,"When I can't remember something, hints do not help"). Other items explicitly allude to a certain syndrome (e.g., amnesia) in such a way that specialists recognize that highly atypical symptoms are listed (e.g., "My past and important events became a blur to me almost overnight"). The idea is that malingerers will exaggerate and so will endorse bizarre, unrealistic, and atypical symptoms. Answers indicating malingering are summed to obtain a Total SIMS score.

So far, a number of analog studies have looked at the accuracy with which the SIMS detects malingered symptomatology (Rogers, Hinds & Sewell, 1996; Smith & Burger, 1997; Edens, Otto & Dwyer, 1999). Although these studies came up with promising results, one should note that with the exception of the study by Cima and colleagues (2002b), all studies relied on laboratory set-ups. In this type of study, undergraduate students are instructed to feign certain psychiatric symptoms (e.g., amnesia) in a convincing way. Performance of these instructed malingering groups on the SIMS is then compared to the SIMS scores of control (i.e., uninstructed) groups responding honestly. It is evident that this approach is subject to a number of limitations, not least of which is that for undergraduates instructed to malinger symptoms there are hardly any risks or incentives. Nevertheless, so far the results with the SIMS are encouraging in that subjects instructed to feign, say, amnesia can be identified with a high degree of precision. For example, Merckelbach and Smith (2001c) reported that more than 90% of the subjects instructed to malinger amnesia are identified by the SIMS (sensitivity) and more than 90% of the control subjects are classified by the SIMS as honest respondents (specificity).

In the one study that systematically looked at SIMS performance of forensic patients (Cima et al., 2002b) a German translation of the SIMS was administered to a sample consisting of 266 participants of whom 204 were undergraduate students (98 men) and 62 were forensic inpatients (all men). The German SIMS showed excellent stability (0.97) as well as an acceptable consistency (Cronbach alpha coefficient = 0.80). None of the participants in the control sample (69 honestly responding healthy subjects) had a total score exceeding the cutoff point of 16 recommended by Rogers et al. (1996), while 86% of the instructed malingerers (n = 135) and 27% of the forensic patients scored in this range.

Data of honestly responding controls, instructed malingers and patients were pooled in order to calculate sensitivity, specificity, positive and negative predictive power (PPP and NPP). Using the cutoff score of 16, 87% of the malingerers were identified correctly (sensitivity), while 86.7% of the non-malingerers were classified correctly (specificity). The Positive Predictive Power (PPP), which is explained in the next section, was 0.87. In other words, the probability that someone with a Total SIMS score of 17 or higher was an instructed malingerer was 87%. The specificity of 86.7% implies a false alarm rate of 13.3%. In other words, 13.3% of the participants who did not receive an instruction to malinger nevertheless had Total SIMS scores exceeding the cutoff point. A closer look at these participants revealed that all of them were forensic psychiatric inpatients.

Diagnostic accuracy

Our discussion so far makes plain that experts who at the request of the court have to evaluate a case in which crime-related amnesia is claimed can and should do more than just interview the defendant. The SVT as well as the SIMS are examples of tests that can be applied in this type of case. Other tests and tasks that can be of help are extensively discussed in Rogers (1997) and Hall and Poirier (2000).

Selection and actual use of tests in amnesia cases should be guided by scientific literature and, more specifically, by what this literature tells the experts about diagnostic accuracy. Experts usually focus on sensitivity and specificity of diagnostic measurements. Sensitivity refers to the percentage of malingerers who are correctly classified by the test, while specificity refers to the percentage of honestly responding controls who are correctly identified. The idea that a diagnostic instrument is valid if research shows that

its sensitivity and specificity circle around 90% seems widely accepted by experts, but is misleading. An example taken from Rosenfeld, Sands and van Gorp (2000) may illustrate this point. Suppose that there is a questionnaire that intends to detect simulated amnesia and suppose that this instrument has been tested in a laboratory study that involved 50 subjects simulating amnesia and 50 honestly responding subjects (control group). Let us further assume that the results of this study showed that 45 of the 50 simulators were identified by this questionnaire (sensitivity = 90%), while 48 of the 50 control subjects were classified correctly (specificity = 96%). So, sensitivity and specificity rates are excellent, but this does not mean that the test is valid. The point is that these rates were obtained with a particular base-rate of malingering, namely 50% (50% of the subjects were simulating amnesia). If one lowers this base rate to, say, 10% (10 subjects simulate versus 90 subjects respond honestly), diagnostic accuracy of the test will drop dramatically, although its sensitivity and specificity remain the same. Table 1 shows this effect. With a base rate of 50%, 45 of the malingerers are correctly identified and 2 honestly responding subjects are misclassified as malingerers. However, with a base rate of 10%, there are 9 correctly classified malingerers and 4 honest subjects who are misclassified. A good measure to capture these proportions is the Positive Predictive Power (PPP). PPP is concerned with the classification of the individual and this is what matters in a legal context. PPP pertains to the probability that an individual with a score that exceeds the cutoff does have the diagnosis (in this case, feigned amnesia). With a base rate of 50%, the PPP of our fictitious instrument was 45/45 + 2 = 96%. However, with a base rate of 10%, the PPP of this instrument drops to 9/9+4 = 69%. In other words, with such a base rate, the probability is 2 out of 3 that someone who has an above-cutoff score does indeed simulate amnesia. The take-home message of this example is that applying tests in order to identify simulated amnesia requires technical knowledge about diagnostic quality parameters (sensitivity, specificity and PPP) of these tests. This is essential, because it is only when the expert possesses such technical knowledge and communicates it to the court that trial judges become aware of strengths and limitations of diagnostic evaluations in amnesia cases.

Table 1: Sensitivity and specificity of a diagnostic instrument and how they relate to base rate. Values in parentheses show what happens when the base rate of malingering drops to 10%: 10 subjects malinger and 90 perform honestly. TP = true positive, FP = false positive, FN = false negative and TN = true negative. Sensitivity = TP/(TP+FN); specificity = TN/(FP+TN); PPP (Positive Predictive Power) = TP/(TP+FP)

	Reality	
	Simulation	**Honest**
Test:		
Simulation	45 (TP) (9)	2 (FP) (4)
Honest	5 (FN) (1)	48 (TN) (86)
Sensitivity	0.90	
Specificity	0.96	
PPP	0.90 (0.69)	

Conclusion

It is not uncommon for defendants to claim amnesia for a crime of which they are accused. Mental health professionals who appear as expert witnesses in such cases often assume that this type of memory loss is the joint effect of strong emotions (i.e., dissociative amnesia) and excessive drug or alcohol use. It is also common to seek arguments for this interpretation by interviewing the defendant. In this article, we explained why this approach is dubious. Dissociative amnesia is not the only or even the most prevalent form of crime-related amnesia. Experts should at least take the possibility of other forms of amnesia into account. These other types involve simulated, imagined or organic amnesia. The diagnostic differentiation between these types of amnesia cannot take place solely on the basis of interviews. Professionals should use objective measures as opposed to relying on clinical judgement alone. Tests (e.g., the SIMS) and tasks (e.g., the SVT) are required to make this differentiation. As with interviews, the use of only one test is not sufficient in determining between the different types of amnesia. No one should be diagnosed as malingering simply from one test. Instead, proper diagnosis entails the appropriate synthesis of information from multiple data sources (structural interviews, observation, other test results), especially in the forensic setting. Statistically based procedures, when used judiciously and in conjunction with multiple data sources, should offset the inherent weaknesses of clinical judgement alone. Although these tests and tasks may seem simple, their use requires sophisticated knowledge about diagnostic quality parameters. Many psychologists and psychiatrists will not possess this knowledge and therefore their competence to act as expert witnesses in cases in which claims of crime-related amnesia are raised is doubtful.

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